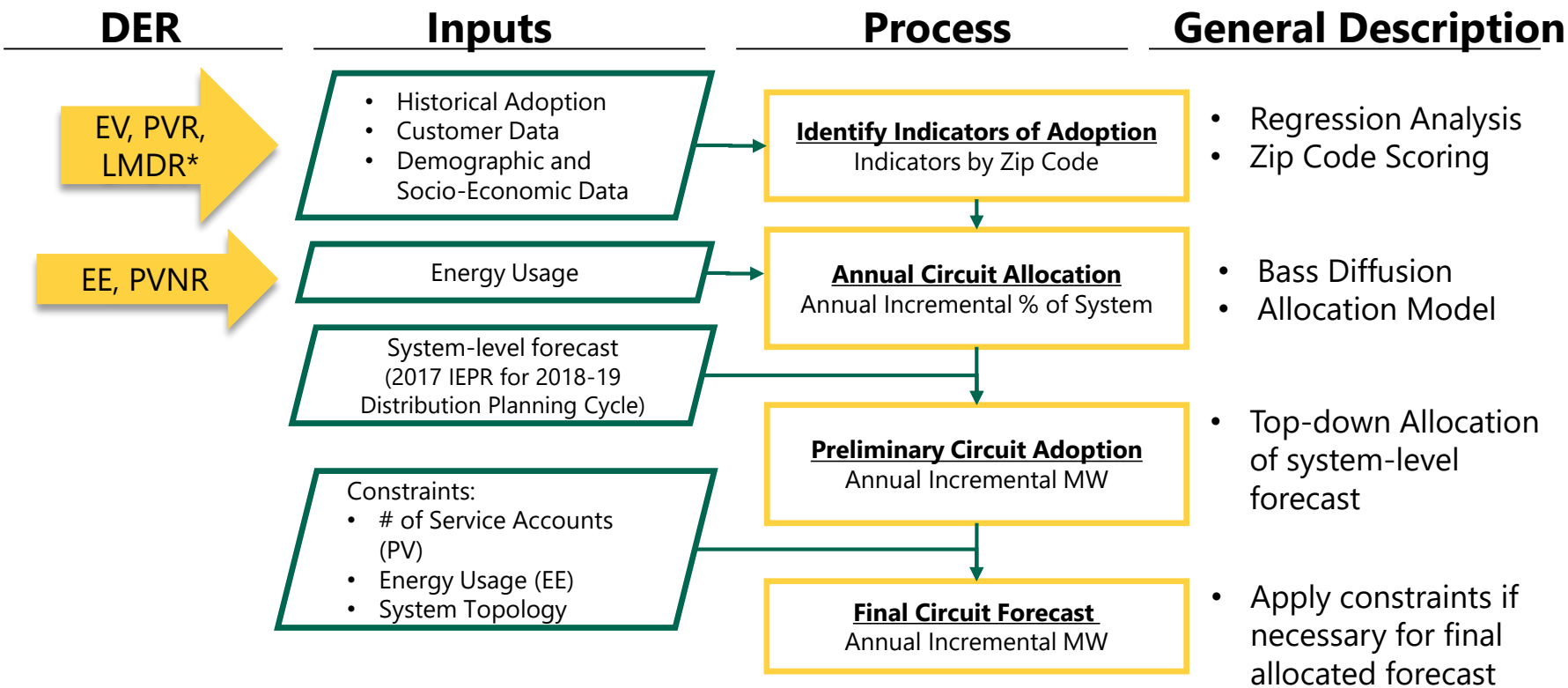
SCE's DER Disaggregation Methodologies

DFWG Meeting #1
April 18th 2018

Energy for What's Ahead®

SOUTHERN CALIFORNIA EDISON®

SCE's Overall DER Disaggregation Process



PVR: Residential Solar PV
PVNR: Non-Residential Solar PV
*LMDR Follows the same process but scoring/development of indicators is done at the customer Level

Energy Efficiency

Suppliers	Inputs	Process	Outputs	Customer
CEC SCE	AAEE by sector & DEER Load Shapes Energy Usage by Sector & System Topology	1. Begin with system level energy 2. Determine sector energy usage by circuit to develop allocation % 3. Allocate system forecast to circuit based on sector % 4. Sum sector savings at each circuit to get total savings	10 Year Forecast at each of SCE's Circuits	SCE Distribution Planning

Load Modifying Demand Response

Suppliers	Inputs	Process	Outputs	Customer
United States Census Bureau acxiom SOUTHERN CALIFORNIA EDISON An EDISON INTERNATIONAL Company	NAICS* Demographic & Socio-economic Data System Topology & Customer Data	1. Identify key indicators of adoption 2. Score each service account 3. Allocate Ex Ante LMDR to existing participants 4. Allocate residual Ex Ante LMDR based on service account score	10 Year Forecast at each of SCE's Circuits	SOUTHERN CALIFORNIA EDISON An EDISON INTERNATIONAL Company Distribution Planning

*North American Industry Classification System

Solar Photovoltaics
(Residential)

Suppliers	Inputs	Process	Outputs	Customer
AMERICAN COMMUNITY SURVEY U.S. CENSUS BUREAU NREL NATIONAL RENEWABLE ENERGY LABORATORY SOUTHERN CALIFORNIA EDISON An EDISON INTERNATIONAL Company	Demographic & Socio-Economic Data PV Technical Potential Energy Usage, Service Accounts, Actual Adoption & System Topology	1. Identify key indicators of adoption 2. Cluster ZIP Codes by key indicators 3. Estimate bass diffusion parameters 4. Calculate potential for each ZIP Code 5. Run bass diffusion for each ZIP Code 6. Determine each ZIP Code's share of forecast 7. Allocate ZIP Code share to circuit 8. Allocate IEPR to circuit based on each circuit's share	10 Year Forecast at each of SCE's Circuits	SOUTHERN CALIFORNIA EDISON An EDISON INTERNATIONAL Company Distribution Planning

*For non-residential PV, SCE allocated the IEPR based on non-residential energy usage

Electric Vehicles

Suppliers	Inputs	Process	Outputs	Customer
American Community Survey, U.S. Census Bureau EPRI Southern California Edison, An Edison International Company Clean Vehicle Rebate Project	Demographic & Socio-Economic Data Actual Adoption by Zip Code System Topology Survey Results	1. Identify key indicators of adoption 2. Score each ZIP Code 3. Allocate IEPR to ZIP Code based on relative ZIP Code propensity 4. Allocate ZIP Code forecast to circuit	10 Year Forecast at each of SCE's Circuits	Southern California Edison, An Edison International Company Distribution Planning

Electric Vehicles

Suppliers

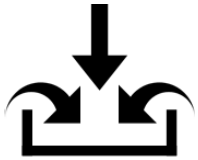
AMERICAN COMMUNITY SURVEY
U.S. CENSUS BUREAU

EPRI

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

CLEAN VEHICLE REBATE PROJECT

Inputs



- Demographic and Socio-Economic Data was obtained from the American Community Survey (ACS)
- EV historical adoption data (POLK) at ZIP Code level provided by EPRI for SCE territory
- Map of ZIP Codes to circuits within SCE provided by SCE's Geospatial Analysis team
- Clean Vehicle Rebate Project (CVRP) consumer survey results provided by Center for Sustainable Energy

Process

1. Identify key indicators of adoption
   - Perform Regression analysis to assess the correlation between the potential propensity indicators (ACS) and EV adoption (EPRI)
     - Education⬆ (Bachelor's Degree or Higher) & travel time to work⬇ (45 minutes to work)
     - Results compared to CVRP
2. Score each ZIP Code
   - Utilize regression results to determine weights for each propensity indicator
   - Calculate EV potential based on Propensity Indicators and convert to % for each ZIP Code
3. Allocate IEPR forecast to ZIP Code based on relative ZIP Code propensity
4. Allocate ZIP Code forecast to circuit using electrical hierarchy and GIS